*Conclusions:* 1) Normal, mildly hypokinetic or severely hypokinetic rest wall motion on echo correlates strongly with PET evidence of viability. 2) For functional recovery of akinetic segments, PET is sensitive but not specific and DE is specific but not sensitive.

04:30

## 722-3 Low Dose Dobutamine Predicts Recovery of Global but not Regional Left Ventricular Function After Revascularization in Patients with Chronic Ischemic Dysfunction

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The purpose of this study was to evaluate the ability of low dose (LD) dobutamine stress echocardiography (DSE) to independently predict recovery of global and regional left ventricular (LV) function following coronary artery bypass surgery (CABG) in patients with ischemic LV dysfunction. Sixteen patients with multivessel coronary artery disease and reduced ejection fraction (EF = 0.25 ± 0.08) underwent DSE prior to CABG, and 2D echo at 20 ± 17 weeks post-CABG (F/U). Global EF was measured at baseline, LD and at F/U; improvement was defined as an increase in EF of >0.05.

Global EF at F/U improved in 11/16 pts (69%). All 11 (100%) pts had improvement in EF on LD DSE. Improvement in regional function was assessed in segments (segs) that were akinetic (AK) or severely hypokinetic (SHK) at baseline. Of 147 SHK/AK segs at baseline, 27 (18%) had LD augmentation; of these 27 segs, 13 (48%) improved on F/U. Of 120 SHK/AK which did not augment at LD, 34 (28%) improved at F/U. The sensitivity (SENSI), specificity (SPECI), positive (PPV) and negative predictive values (NPV) of LD augmentation for predicting improvement in regional and global LV function were:

| | SENSI | SPECI | PPV | NPV | p |
|---|---|---|---|---|---|
| Regional | 38% | 86% | 48% | 72%* | 0.05* |
| Global | 100% | 60% | 85%‡ | 100% | 0.02‡ |

*Conclusions:* 1) Improvement in EF during LD DSE predicts recovery of global LV function with a PPV of 85%, and 2) Failure of individual AK or SHK segments to improve with LD DSE predicts lack of recovery at F/U with a NPV of 72%.

Low dose dobutamine stress echocardiography can therefore be used to predict recovery of global function and lack of recovery of regional ventricular function following revascularization in patients with chronic ischemic dysfunction. It may be of relative greater value in predicting global as compared to regional function.

04:45

## 722-4 Comparison of Thallium Reinjection Scintigraphy to Dobutamine Echocardiography for Detecting Myocardial Viability

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Only moderate degree of concordance has been reported between stress-redistribution-reinjection thallium scintigraphy (Th-R) and dobutamine echocardiography (DE) for the identification of myocardial viability after acute myocardial infarction (AMI). Th-R with rest-reinjection performed 4 hours after exercise testing and digitized 2-D ultrasound reconstruction of the left ventricle (2-D E) at baseline and after low-dose dobutamine (5–10 gamma/kg/min) infusion were compared in 30 pts within the third week after AMI. Both Th-R and 2-D E were interpreted in 16 segments/pt. 2-D E in each wall motion was scored from 1 (normal) to 4 (dyskinesia). Myocardial viability was identified on 2-D E wall motion improvement ≥1 grade from baseline to 2-D E performed at least 30 days after systematic revascularization procedure of the infarct-related artery. Of 157 segments with 2-D E baseline wall motion abnormalities, 62 segments showed reversible defect during Th-R and 41 a wall motion improvement during DE (concordance of 67%). Myocardial viability was identified after angioplasty (n = 25) or surgery (n = 5) in 48 segments. Positive and negative predictive values (PPV and NPV) of Th-R and DE in the diagnosis of myocardial viability are depicted in the table.

| | PPV | NPV |
|---|---|---|
| DE | 92% | 60% |
| Th-R | 75% | 61% |

*Conclusion:* Dobutamine echocardiography is slightly more accurate than Th-R to identify myocardial viability after acute myocardial infarction.

05:00

## 722-5 Dobutamine Echocardiography and Rest SPECT Tl-201 Scintigraphy are More Concordant in Detecting Viability in Hibernating than Stunned Myocardium

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Perfusion and function are mismatched in stunned myocardium and matched in hibernating myocardium. To determine the relationship between perfusion and functional impairment, 82 patients with stunned myocardium (left ventricular [LV] dysfunction after acute myocardial infarction [MI], 59 ± 13 yrs.) and 16 patients with hibernating myocardium (chronic LV dysfunction due to multivessel coronary disease, 60 ± 15 yrs.) underwent low dose dobutamine echocardiography (DE) and rest SPECT Tl-201 (3 mCi, 3 hr. imaging) scintigraphy. Both studies were analyzed according to the standard 16 segment model and 4 point scoring systems. Nonviability was defined as akinesis unresponsive to dobutamine (DE) or severely reduced uptake (Tl-201) in ≥4 segments of a vascular territory. Concordance (%) was analyzed in 736 segments (351 normal [N] or hypokinetic [H] and 385 akinetic [A]) from the 82 patients with acute MI and 256 segments (120 N or H and 136 A) from the 16 patients with chronic dysfunction.

| | Acute | | | | Chronic | | | |
|---|---|---|---|---|---|---|---|---|
| Tl-201 Viable | + | + | − | − | + | + | − | − |
| DE Viable | + | − | + | − | + | − | + | − |
| Total Seg | 59 | 10 | 11* | 20 | 63 | 14 | 2 | 21 |
| N or H | Seg 92* | 0 | 8* | 0 | 99 | 0 | 1 | 0 |
| A Seg | 29 | 20 | 13* | 38 | 30 | 27 | 4 | 39 |
| Patients | 47* | 12 | 12* | 29 | 59 | 6 | 0 | 35 |

*p < 0.05 vs chronic

In conclusion, concordance of DE and Tl-201 scintigraphy is very high in hibernating and reduced in stunned myocardium indicative of the effects of matched and mismatched perfusion and function.

05:15

## 722-6 Prediction of Recovery of Function of Hibernating Myocardium After Coronary Angioplasty: Comparison of Dobutamine Echocardiography and Rest-Redistribution Thallium Tomography

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Dobutamine echocardiography (DE) and rest-redistribution Thallium-201 (Tl) scintigraphy are promising techniques in the evaluation of myocardial hibernation. To assess the comparative accuracy of both modalities in the prediction of recovery of function following revascularization, 14 patients with chronic stable coronary artery disease and regional dysfunction underwent DE, rest and 4h redistribution Tl tomography prior to, and late (6–8 wks) following coronary angioplasty. Low and high dobutamine doses were used (2.5 up to 40 μg/kg/min). A 13 segment-LV model was used for analysis of both, quantitative Tl tomograms and semiquantitative wall motion score (6 grades; hyperkinesia = 0 to dyskinesia = 5). Serial resting echocardiograms were digitized and randomized on a quad-screen. Of 182 segments, 91 had abnormal wall motion of which 54 were revascularized. Seventeen of the 54 revascularized segments (31%) exhibited significant recovery of function (≥2 grade improvement) at late follow-up. In contrast, of the 37 dysfunctional segments not revascularized, none had improvement in function. In these unrevascularized dysfunctional segments, resting Tl uptake was unchanged from pre- to late post angioplasty (68% vs 63%, p = NS). However, in revascularized segments, a significant improvement in Tl uptake was observed, the most pronounced being in segments showing recovery of function (72% to 89%, p = 0.0002, n = 17). Criteria for prediction of recovery of function were, for DE, the presence of biphasic response (augmentation at low dose and worsening at peak dose) and for Tl, a resting uptake ≥60% or an increase to ≥60% upon redistribution). The sensitivity for prediction of recovery of function of individual segments was 94% for DE and 100% for Tl tomography with a specificity of 84% for DE and 53% for Tl. In false positive segments by Tl (n = 18), resting uptake was unchanged after angioplasty (78% vs 83%, p = NS). Analysis by patients showed similar findings: both DE and Tl tomography were 100% sensitive with a specificity of 78% and 63%, respectively. Dobutamine echocardiography and rest-redistribution Tl tomography are therefore helpful in the assessment of myocardial hibernation. While both tests have similar sensitivity, dobutamine echocardiography appears to have a higher specificity for predicting significant recovery of systolic function following revascularization.